

FIG. 1A

FIG. 1B is a perspective view of the assembly 100 in an exploded view, showing the components 101, 110, 116, 106, 105, 107, 175, 120, and 50.

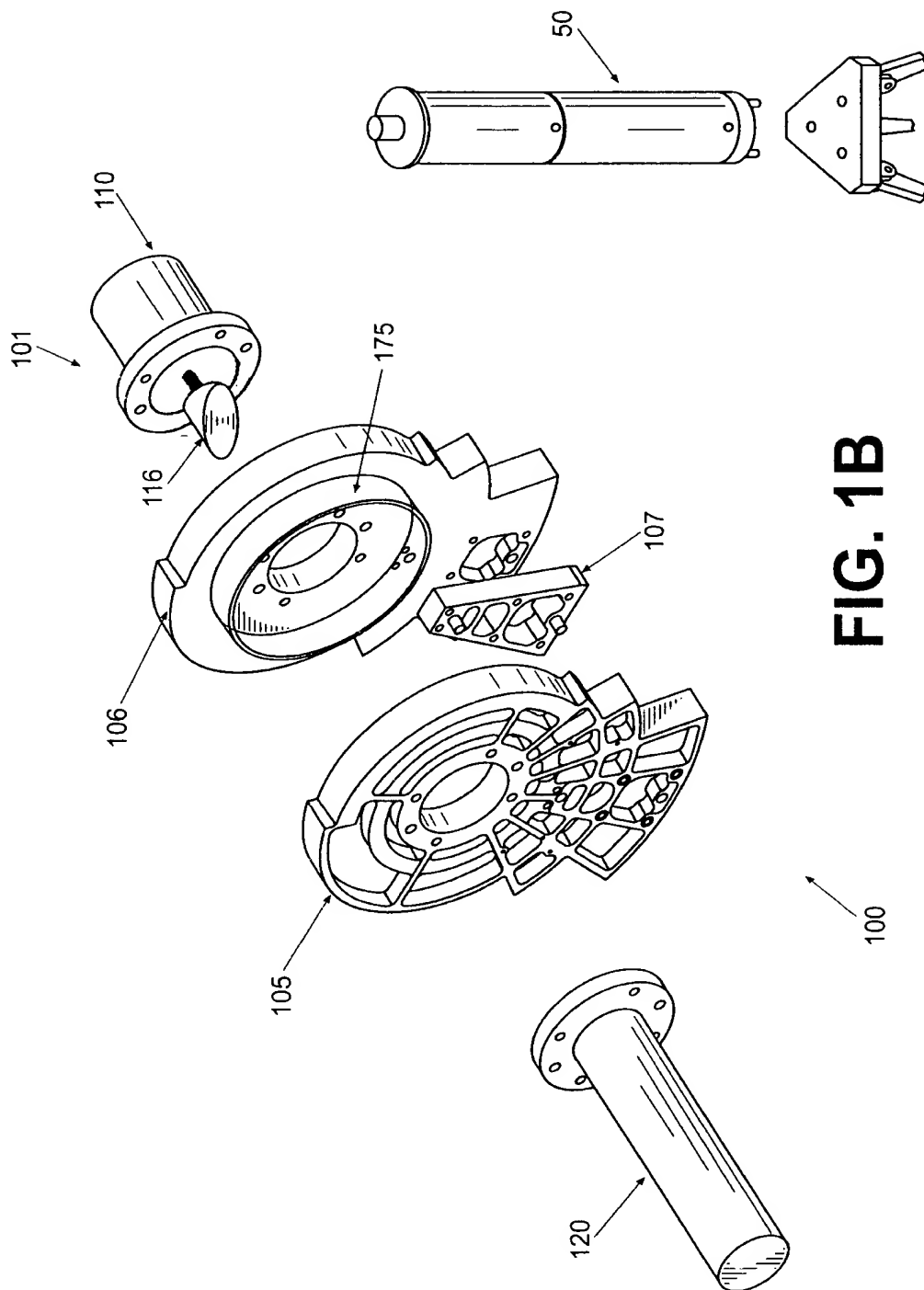


FIG. 1B

FIG. 1C is a top view of the device 100 in a first position, showing the circular opening 106 and the rectangular opening 110. The device 100 is connected to the base 50 via a vertical support structure. The dashed line 101 indicates the boundary of the device 100.

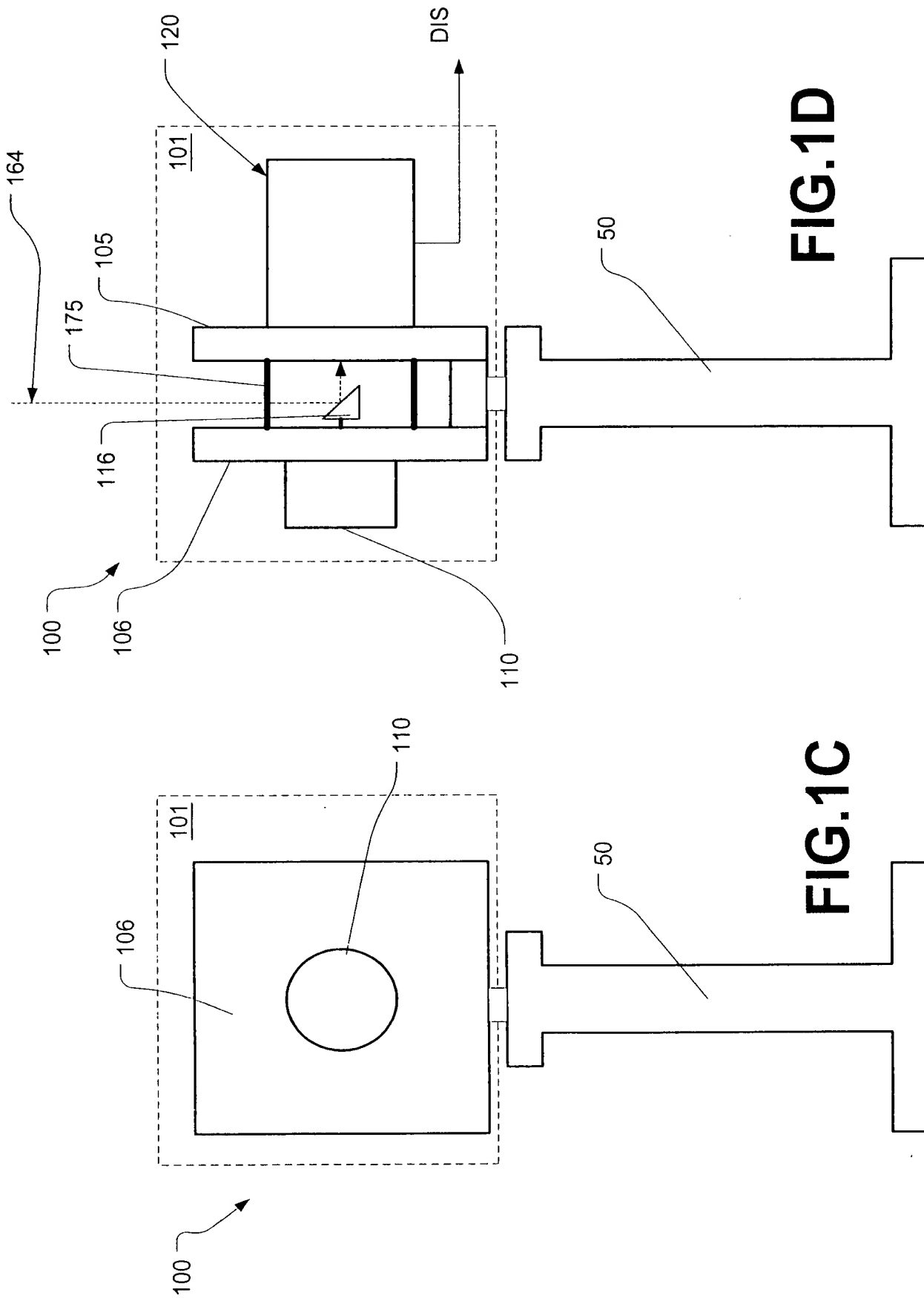


FIG.1C

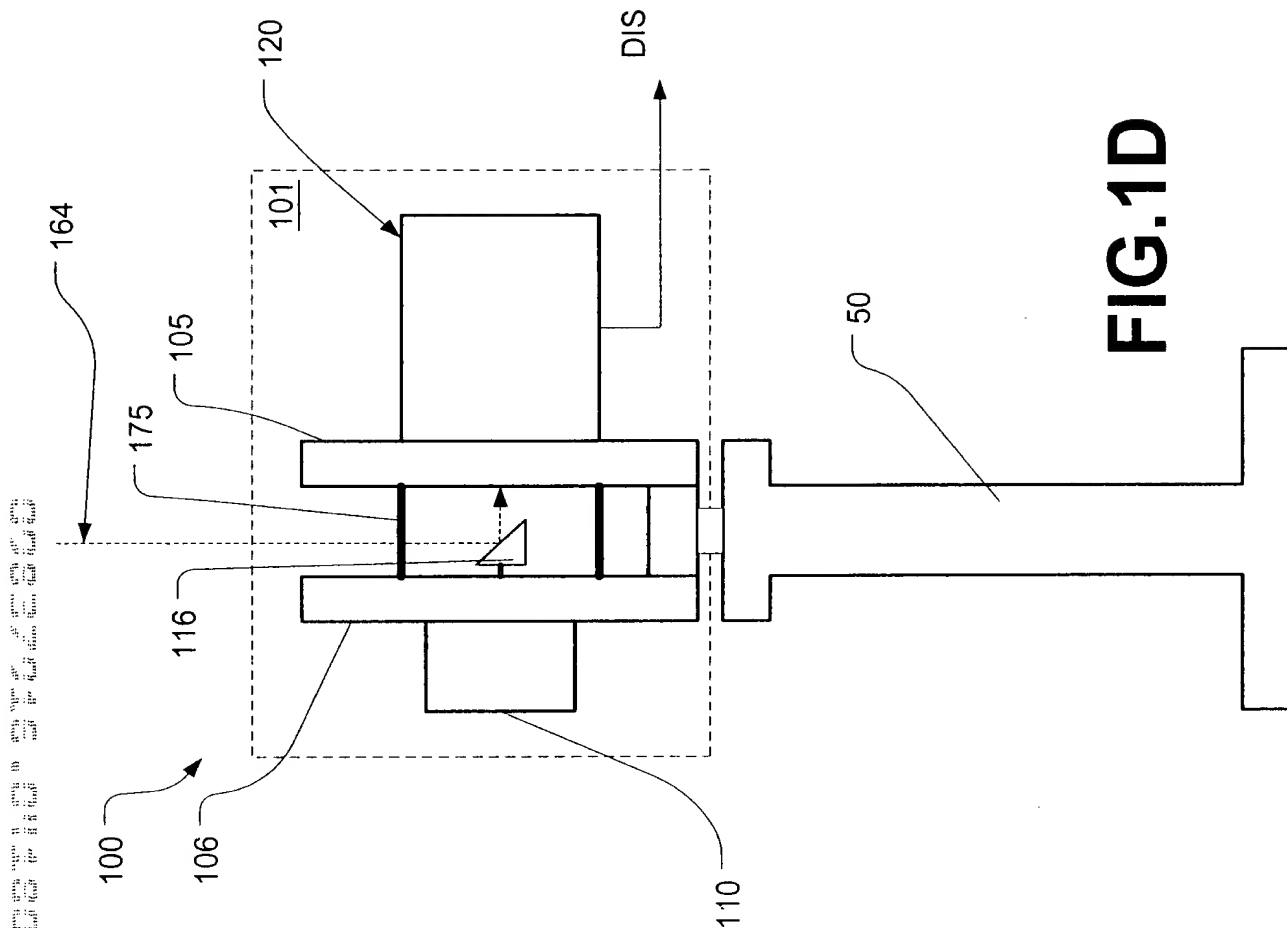


FIG.1D

FIG. 2A is a schematic diagram of a scanning system 100. The system includes a scan motor controller 25, a scan motor 110, a sweep motor controller 135, and a sweep motor 145. The scan motor 110 is connected to the scan motor controller 25 and is used to rotate a mirror 111. The sweep motor 145 is connected to the sweep motor controller 135 and is used to rotate a mirror 127. The mirrors 111 and 127 are used to direct a light beam 162 from a light source 20 through a series of optical components including lenses 106, 107, and 108, and mirrors 105, 109, and 110, to a target 164. The system also includes a detector 150 and a display 120. The detector 150 is used to detect the light beam 162 and the display 120 is used to display the detected light beam 162. The system is controlled by a microcontroller 130 which is connected to the scan motor controller 25, the sweep motor controller 135, the detector 150, and the display 120.

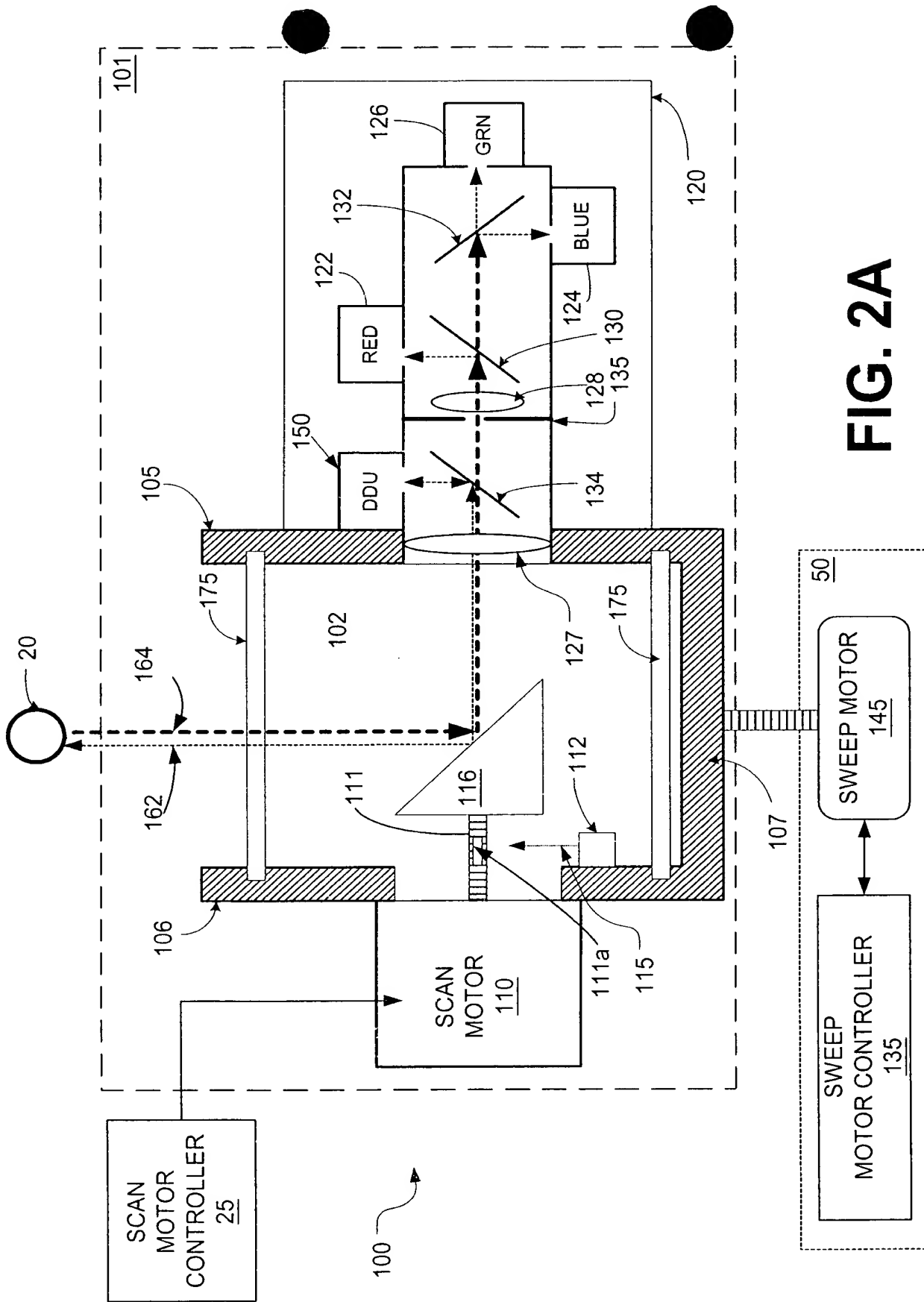


FIG. 2A

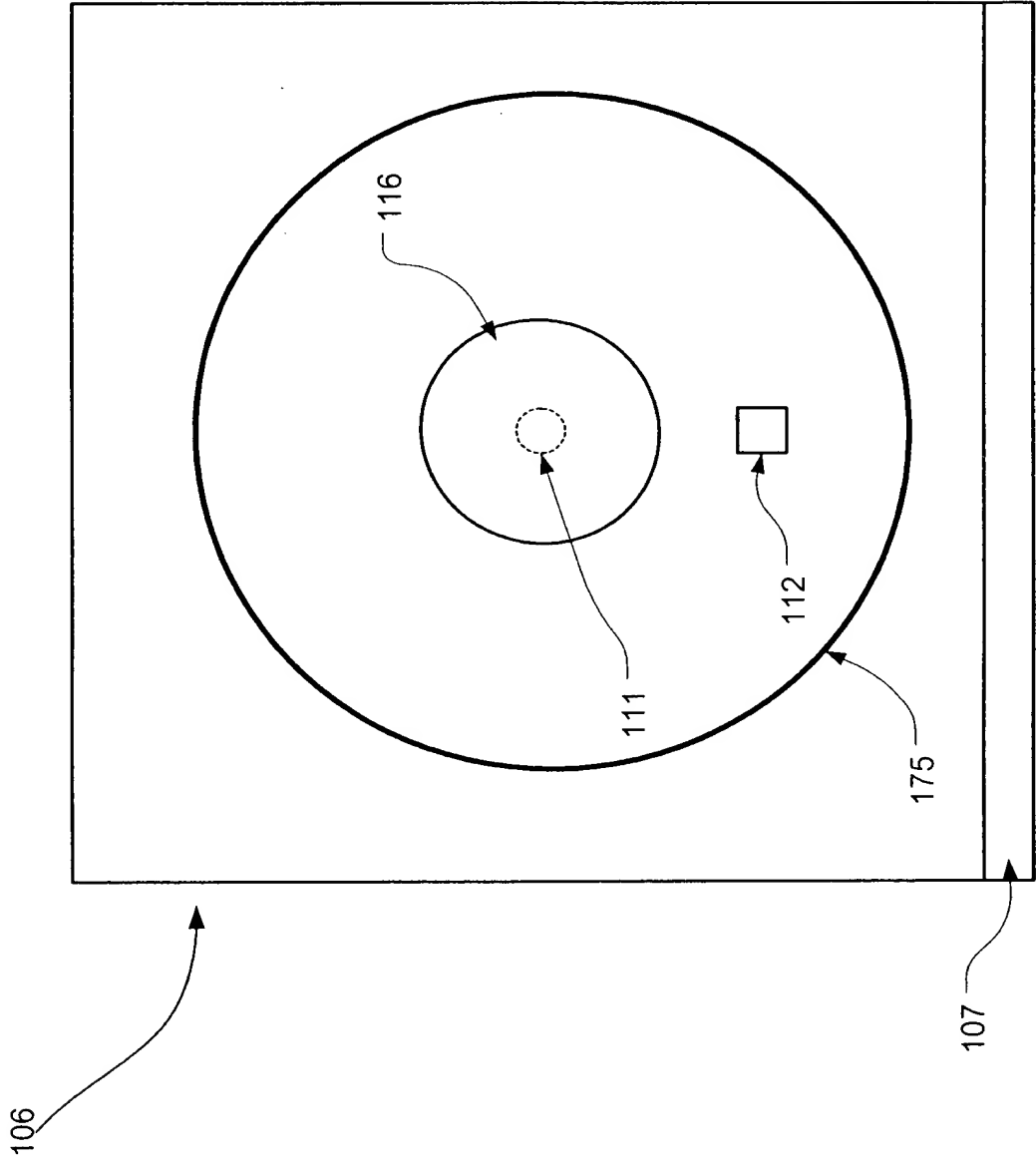


FIG. 2B

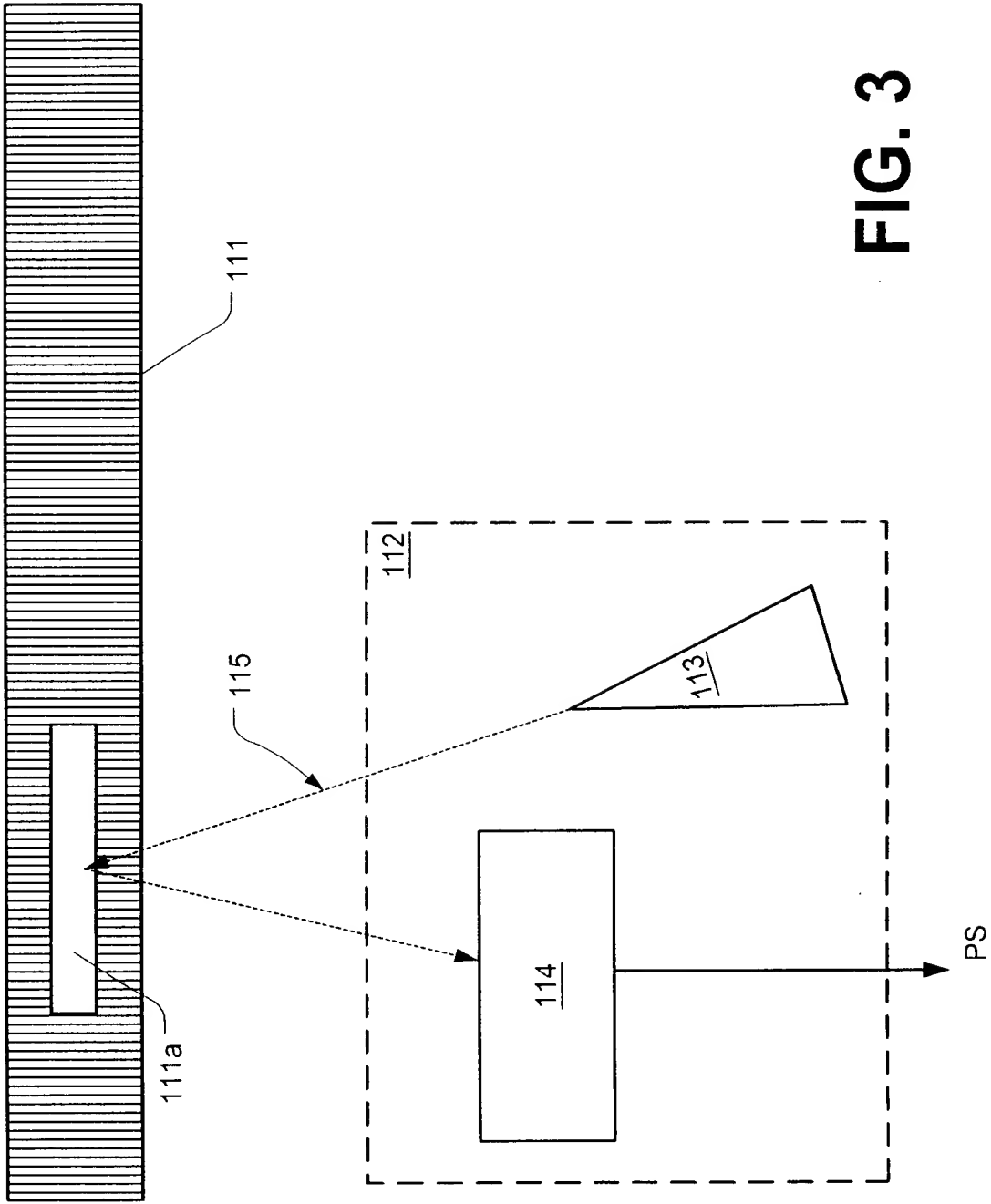


FIG. 3

FIG. 4A is a schematic diagram of a system for measuring the thickness of a substrate.

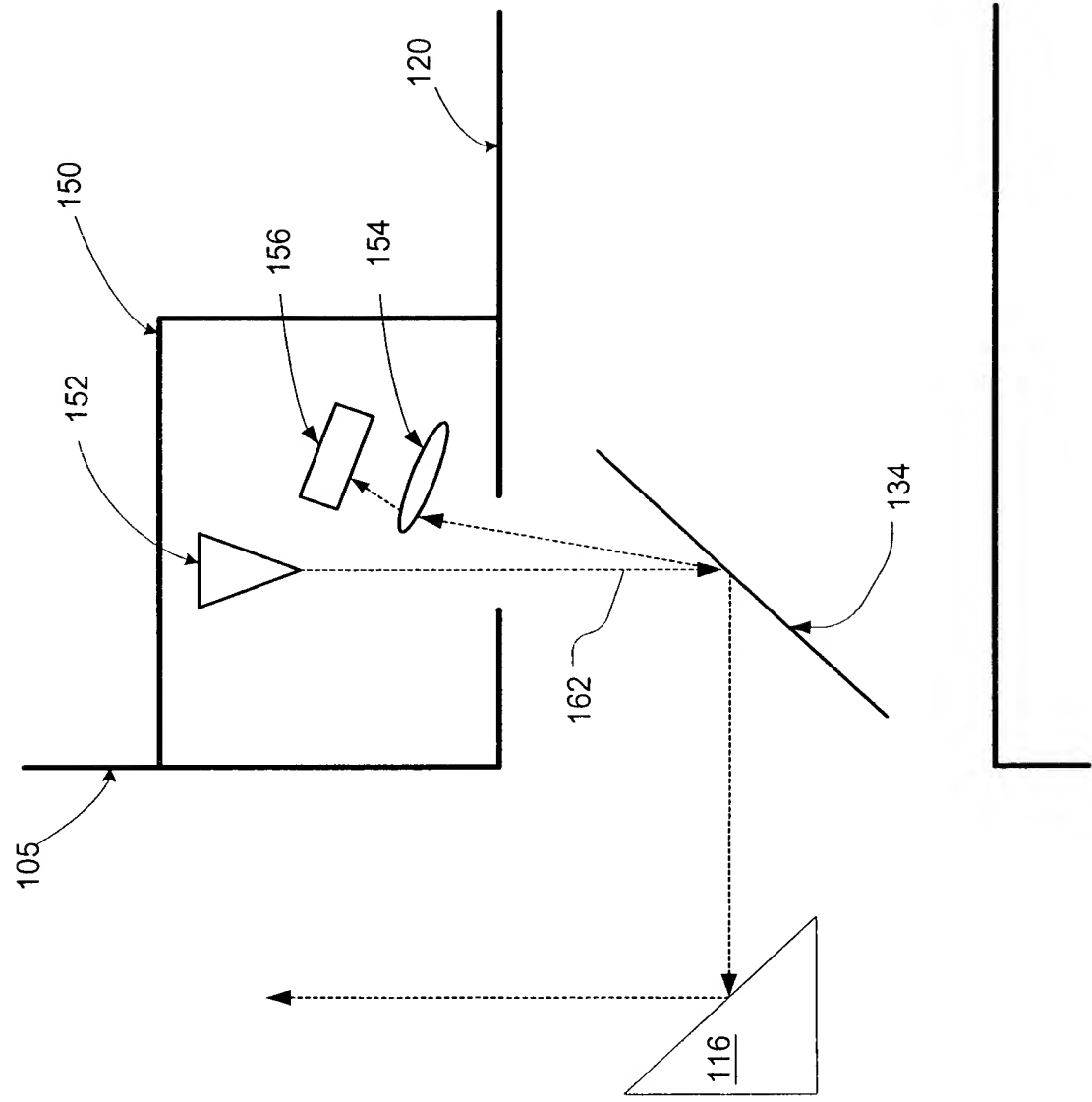


FIG. 4A

FIG. 4B is a schematic diagram of a system 20, which includes a light source 101, a lens 116, a detector 152, and a control unit 156. The light source 101 emits a beam of light 162, which is focused by the lens 116 onto the detector 152. The control unit 156 is connected to the detector 152 and the light source 101.

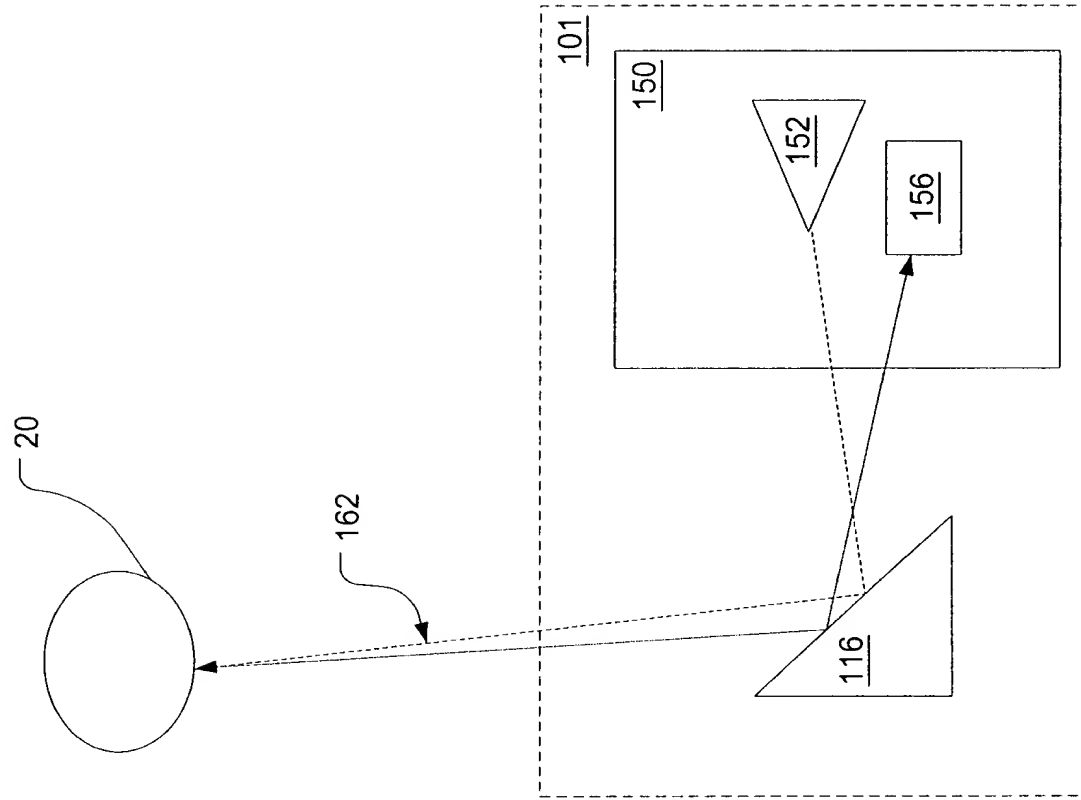


FIG. 4B

FIG. 4C is a schematic diagram of a system 100 for measuring a distance D1 between a point A and a point B. The system 100 includes a light source 152, a lens 154, and a detector 156. The light source 152 emits a beam of light 162 that passes through the lens 154 and is focused onto the detector 156. The distance D1 is the distance between the point A and the point B. The distance D2 is the distance between the point B and the detector 156. The distance D3 is the distance between the point A and the detector 156. The system 100 is used to measure the distance D1 between the point A and the point B.

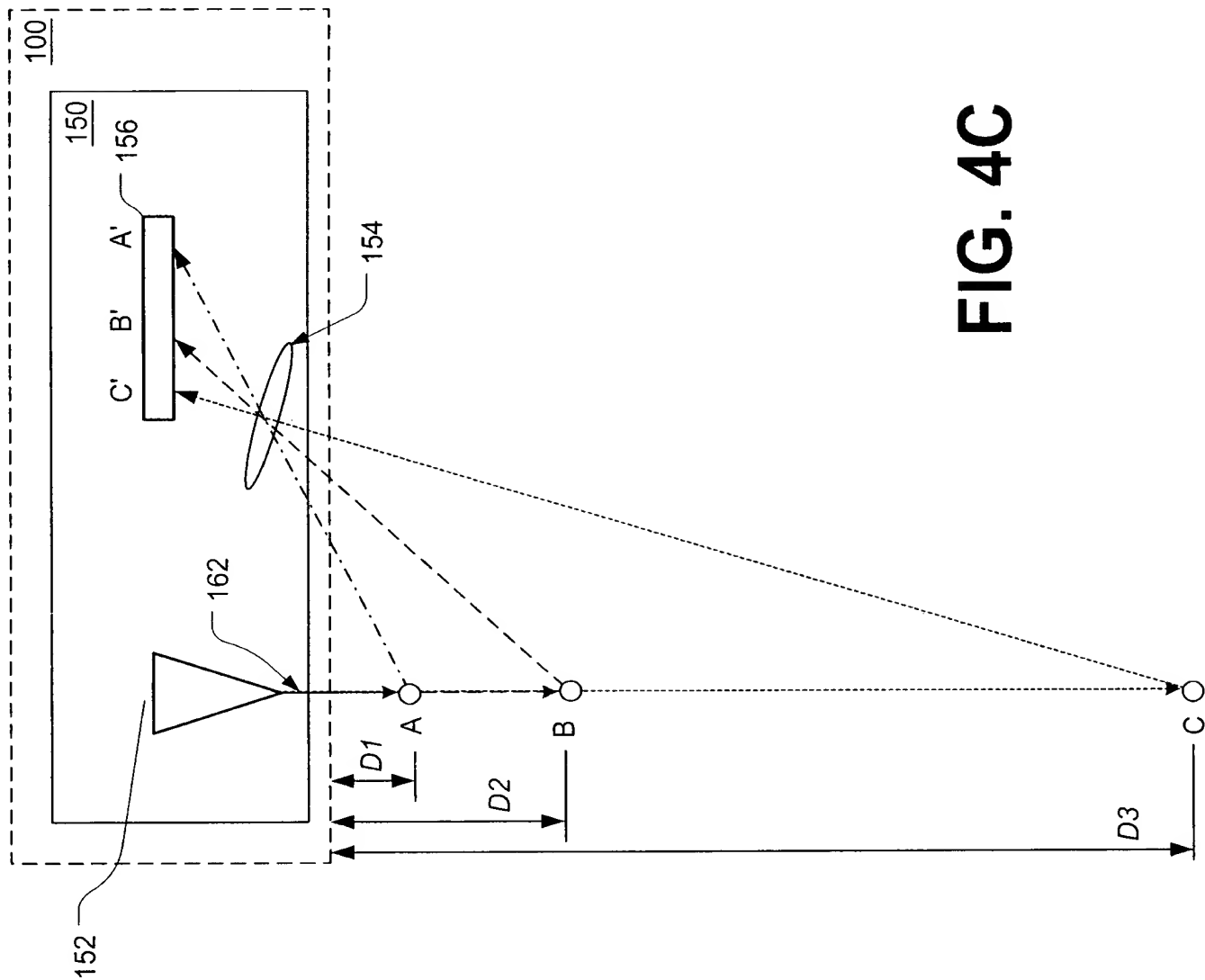


FIG. 4C

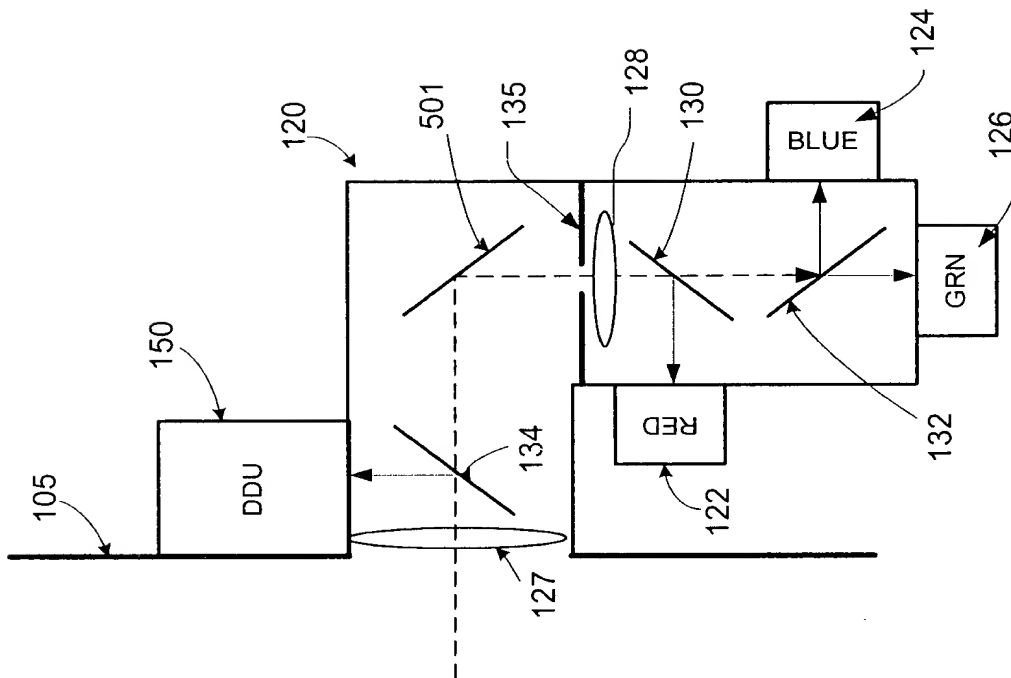


FIG. 5

FIG. 6 is a schematic diagram of a system 100 for scanning a target 162. The system 100 includes a scan motor controller 25, a scan motor 102, a sweep motor 145, and a sweep motor controller 135. The scan motor 102 is connected to the scan motor controller 25 and is used to rotate the target 162. The sweep motor 145 is connected to the sweep motor controller 135 and is used to rotate the target 162. The target 162 is a rectangular plate with a central opening 110. The target 162 is mounted on a base 101. The target 162 is rotated by the scan motor 102 and the sweep motor 145. The target 162 is used to scan a target 162. The target 162 is a rectangular plate with a central opening 110. The target 162 is mounted on a base 101. The target 162 is rotated by the scan motor 102 and the sweep motor 145. The target 162 is used to scan a target 162.

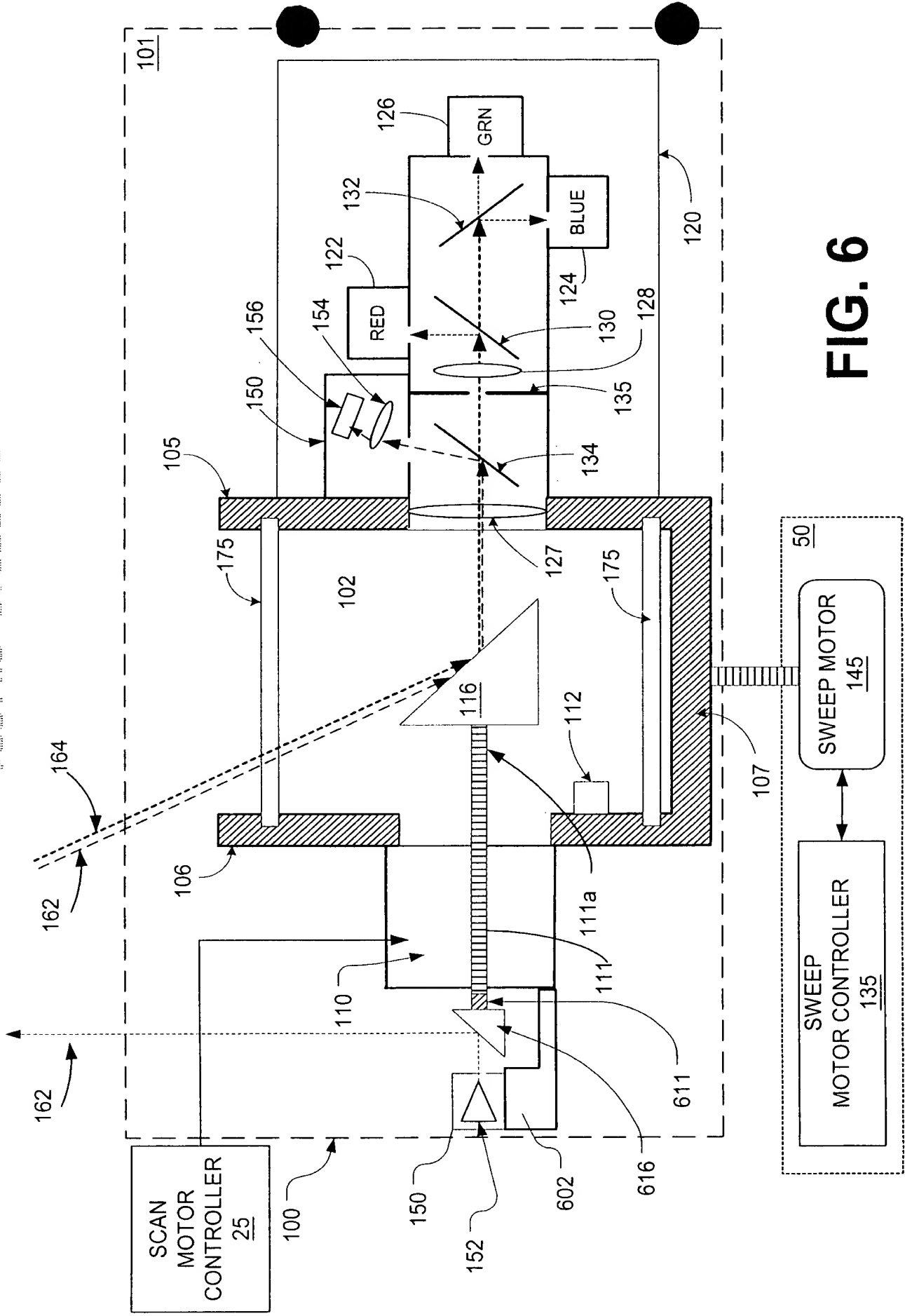


FIG. 6

FIG. 7 is a schematic diagram of a system 100 for processing data.

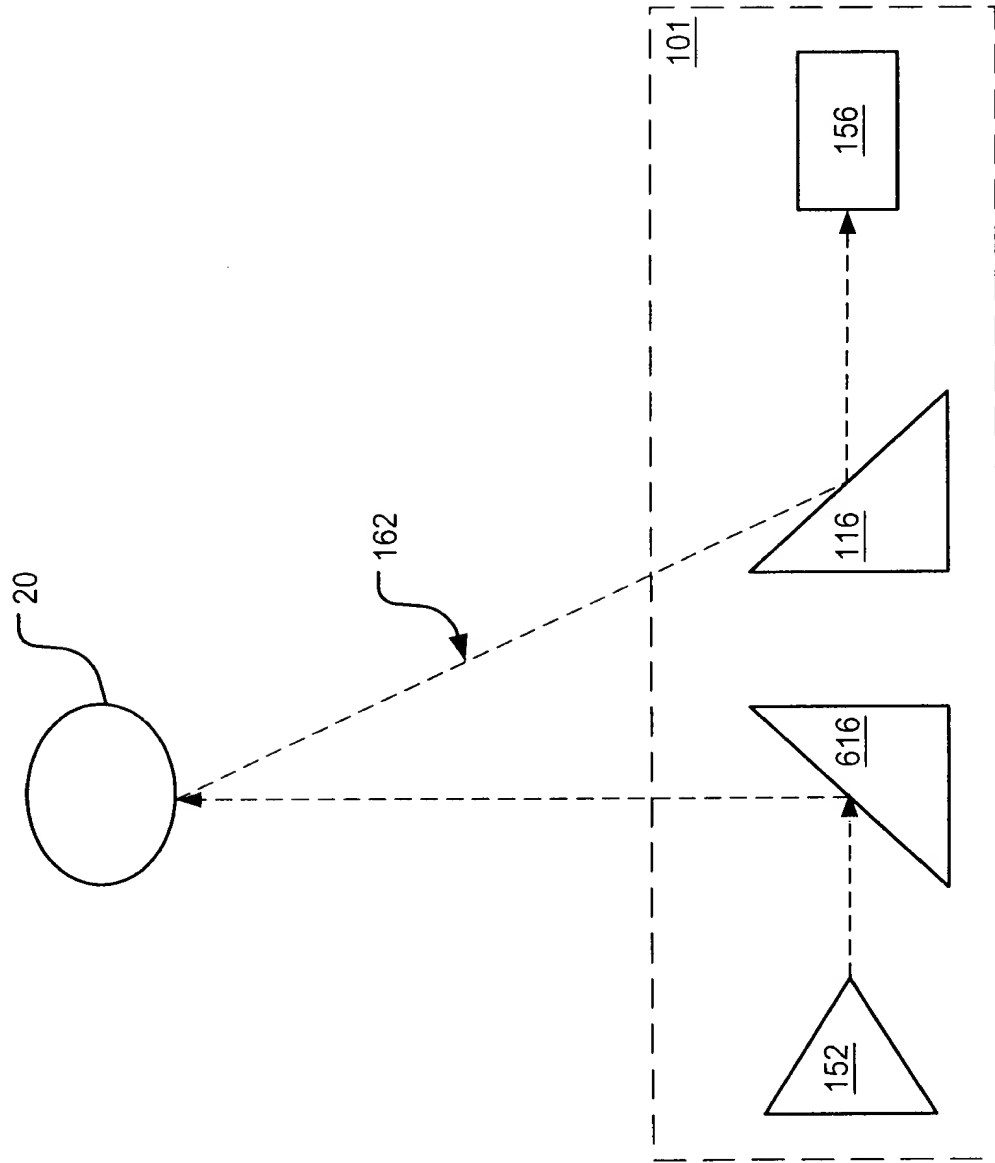


FIG. 7

Symbol	Unit	Value	Symbol	Unit	Value	Symbol	Unit	Value	Symbol	Unit	Value
ρ_{air}	g cm^{-3}	1.205	ρ_{water}	g cm^{-3}	1.000	ρ_{steel}	g cm^{-3}	7.85	ρ_{glass}	g cm^{-3}	2.50
μ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	μ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	μ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	μ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
σ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	σ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	σ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	σ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
τ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	τ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	τ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	τ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
κ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	κ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	κ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	κ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
λ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	λ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	λ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	λ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
η_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	η_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	η_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	η_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
ν_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	ν_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	ν_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	ν_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
ξ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	ξ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	ξ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	ξ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
ζ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	ζ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	ζ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	ζ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
θ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	θ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	θ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	θ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
ϕ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	ϕ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	ϕ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	ϕ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
χ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	χ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	χ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	χ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
ψ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	ψ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	ψ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	ψ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
ω_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	ω_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	ω_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	ω_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
δ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	δ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	δ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	δ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
ϵ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	ϵ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	ϵ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	ϵ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
ζ_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	ζ_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	ζ_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	ζ_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003
η_{air}	$\text{cm}^2 \text{g}^{-1}$	0.0001	η_{water}	$\text{cm}^2 \text{g}^{-1}$	0.0002	η_{steel}	$\text{cm}^2 \text{g}^{-1}$	0.0005	η_{glass}	$\text{cm}^2 \text{g}^{-1}$	0.0003

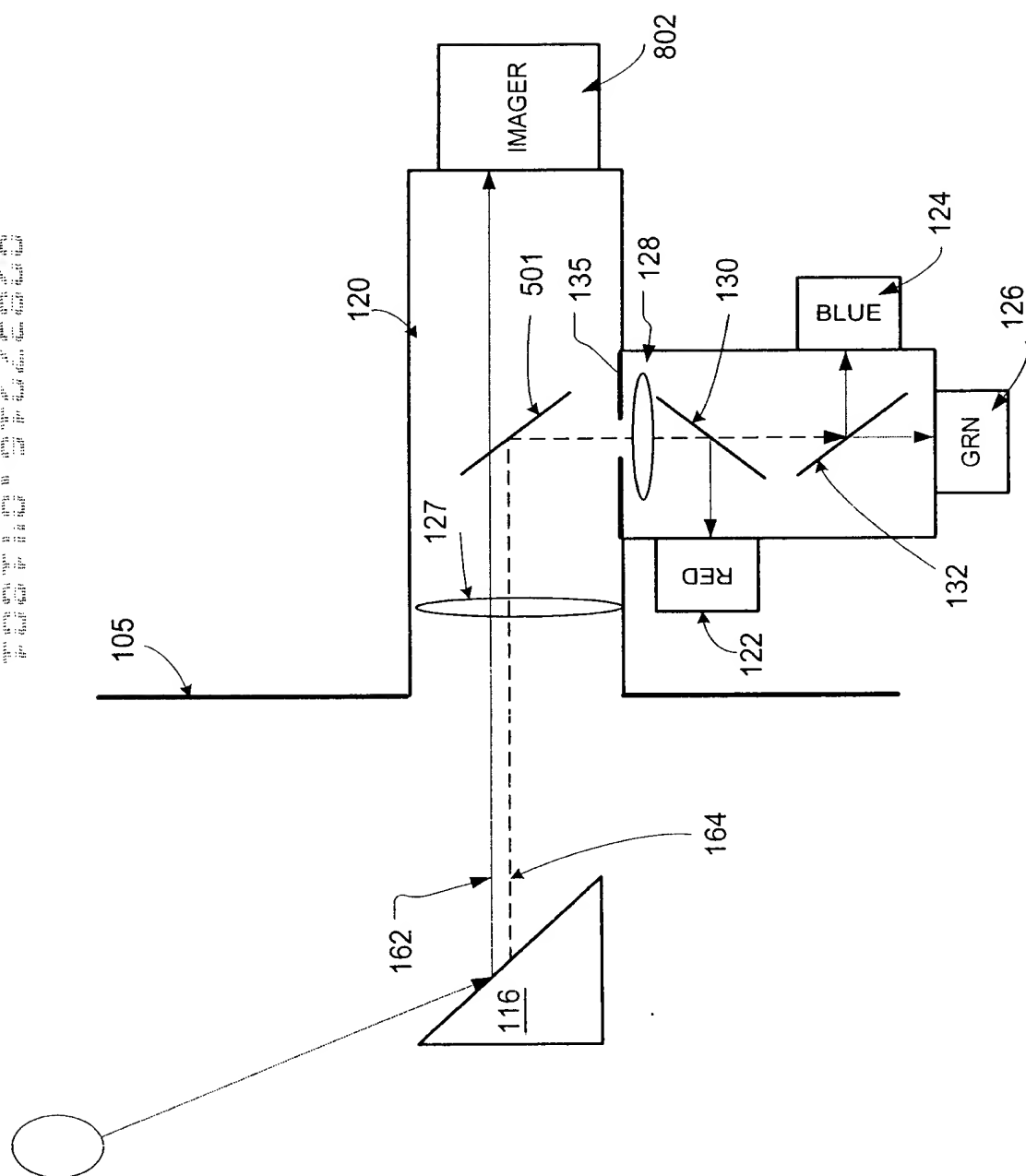


FIG. 8A

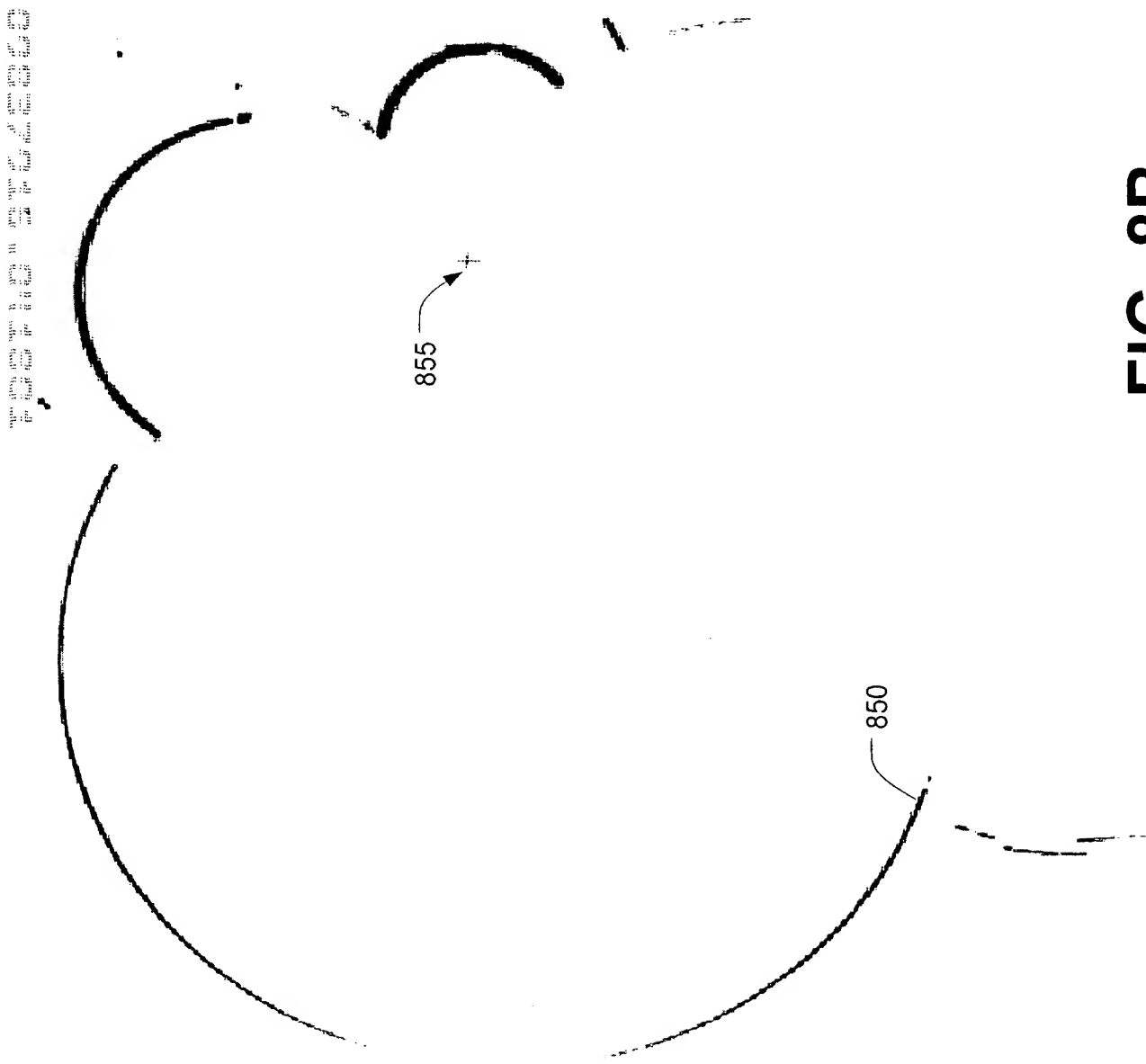


FIG. 8B

FIG. 9 is a schematic diagram of a sweep motor assembly 150. The assembly includes a sweep motor 145, a sweep motor controller 135, a gear box 146, and a ball bearing set 147. The sweep motor 145 is connected to the sweep motor controller 135 via a bidirectional arrow. The sweep motor 145 is also connected to the gear box 146 via a shaft 151. The gear box 146 is connected to the ball bearing set 147 via a shaft 153. The ball bearing set 147 is connected to a component 153 via a shaft 153. The entire assembly is enclosed in a dashed box 150.

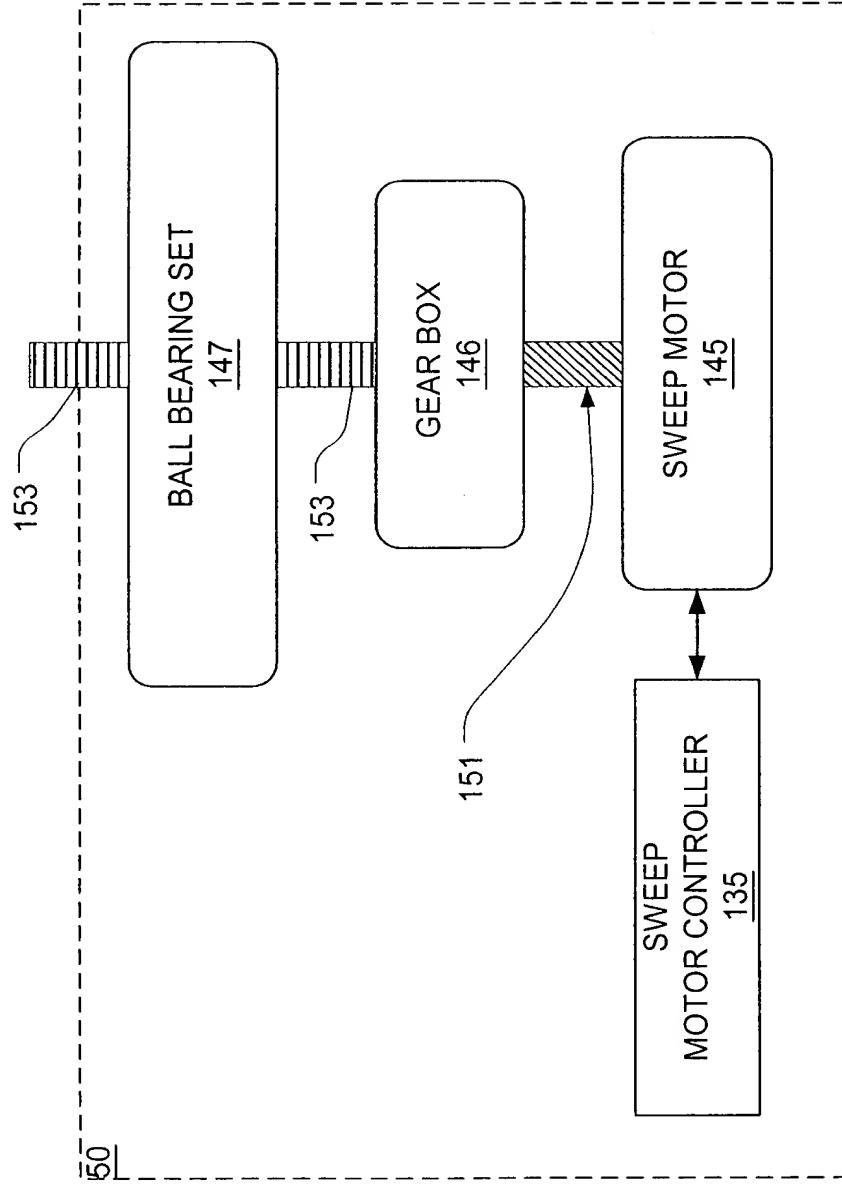


FIG. 9

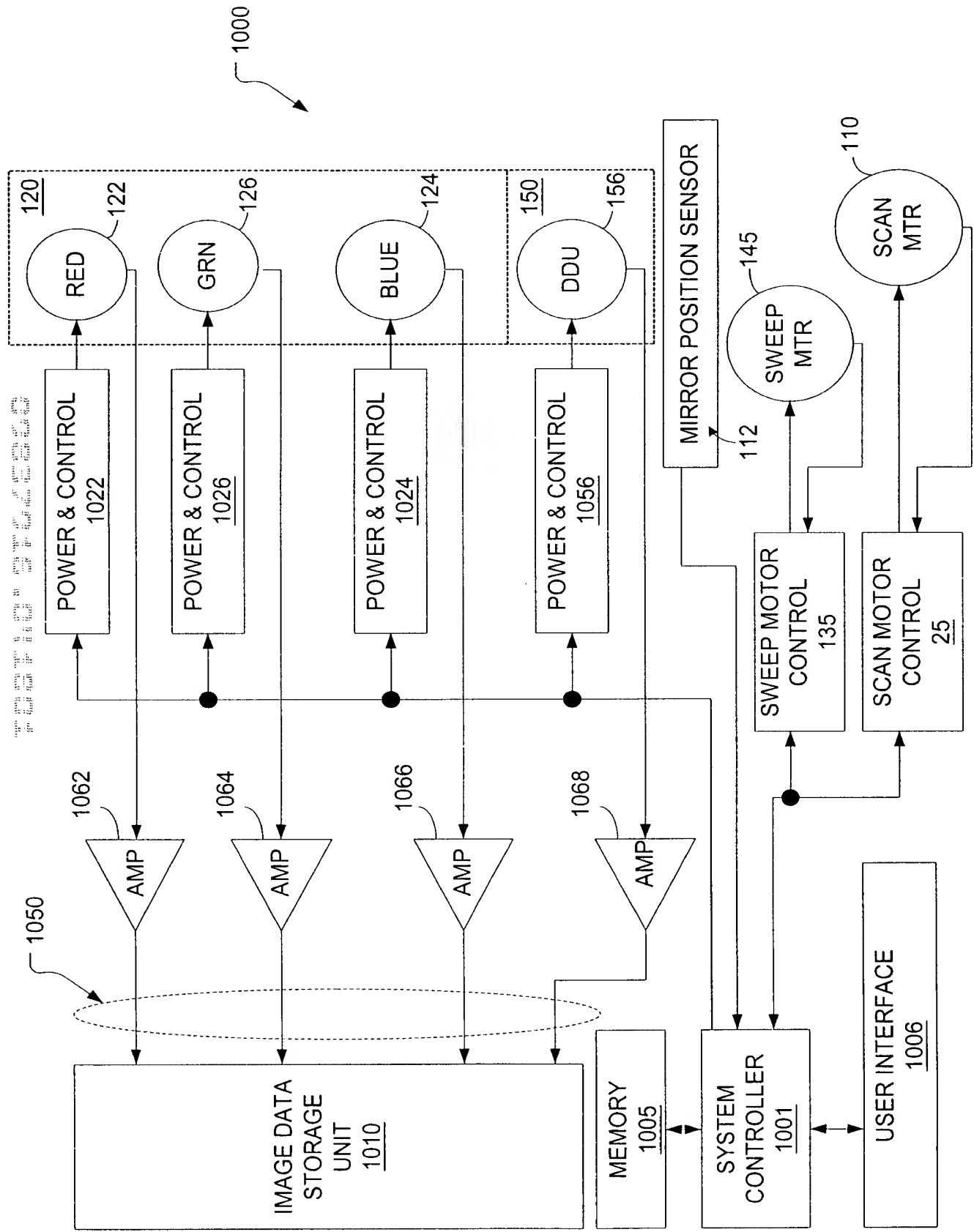


FIG. 10

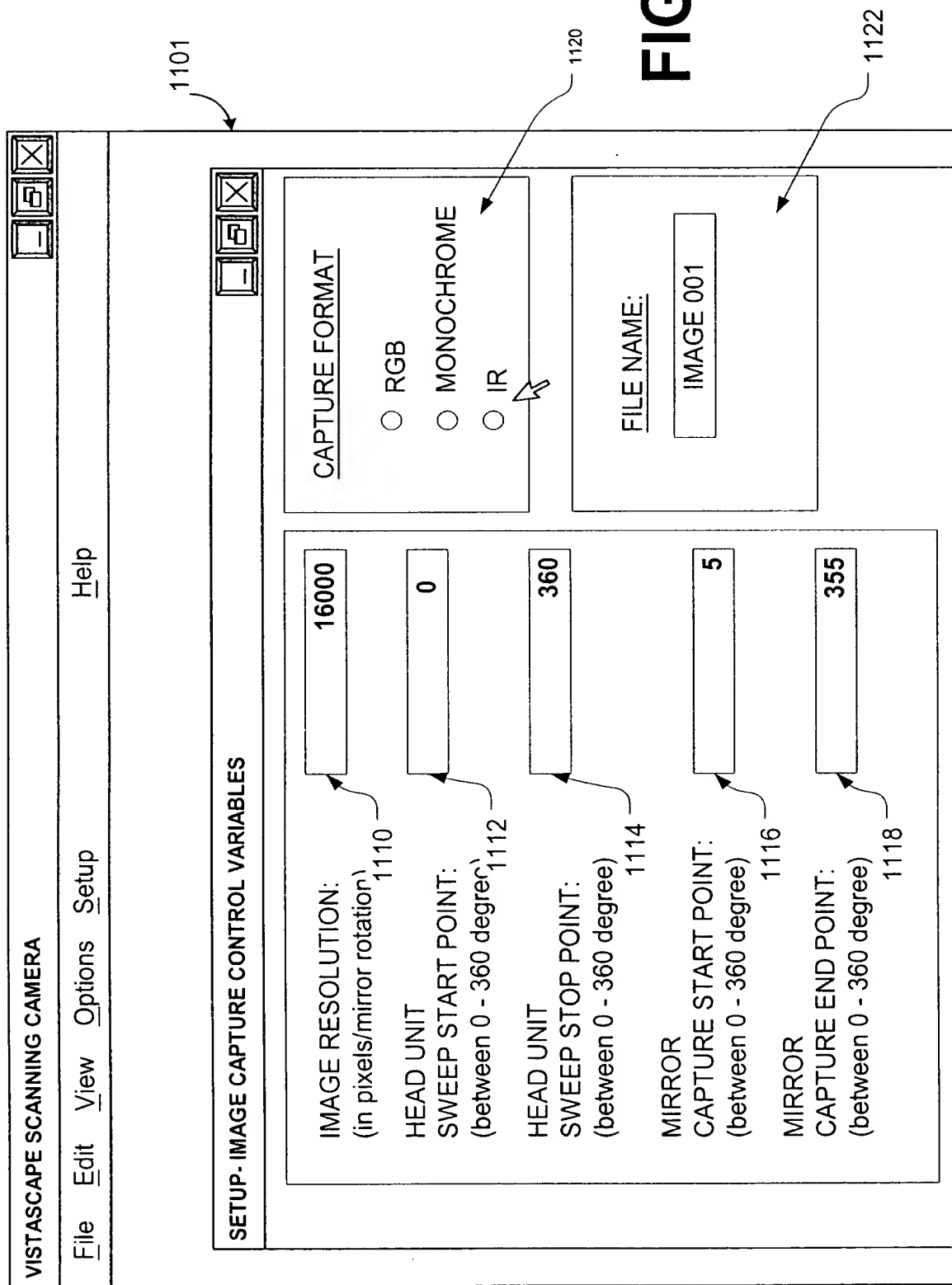


FIG. 11

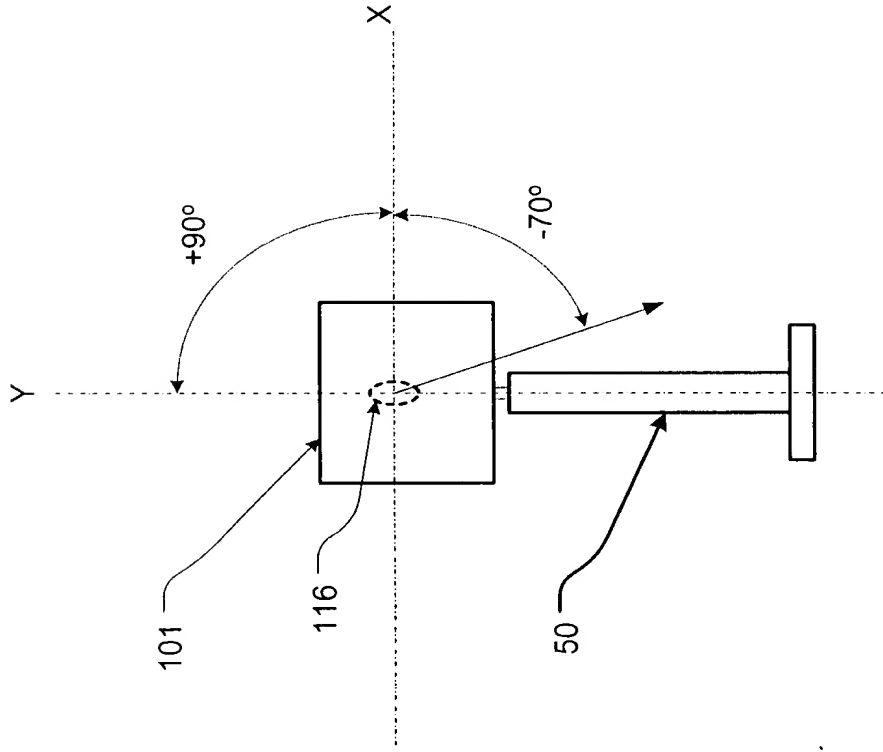


FIG. 12A

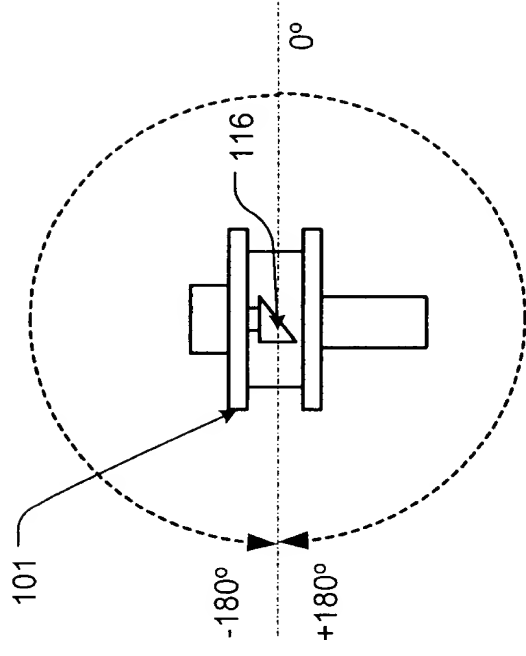


FIG. 12B

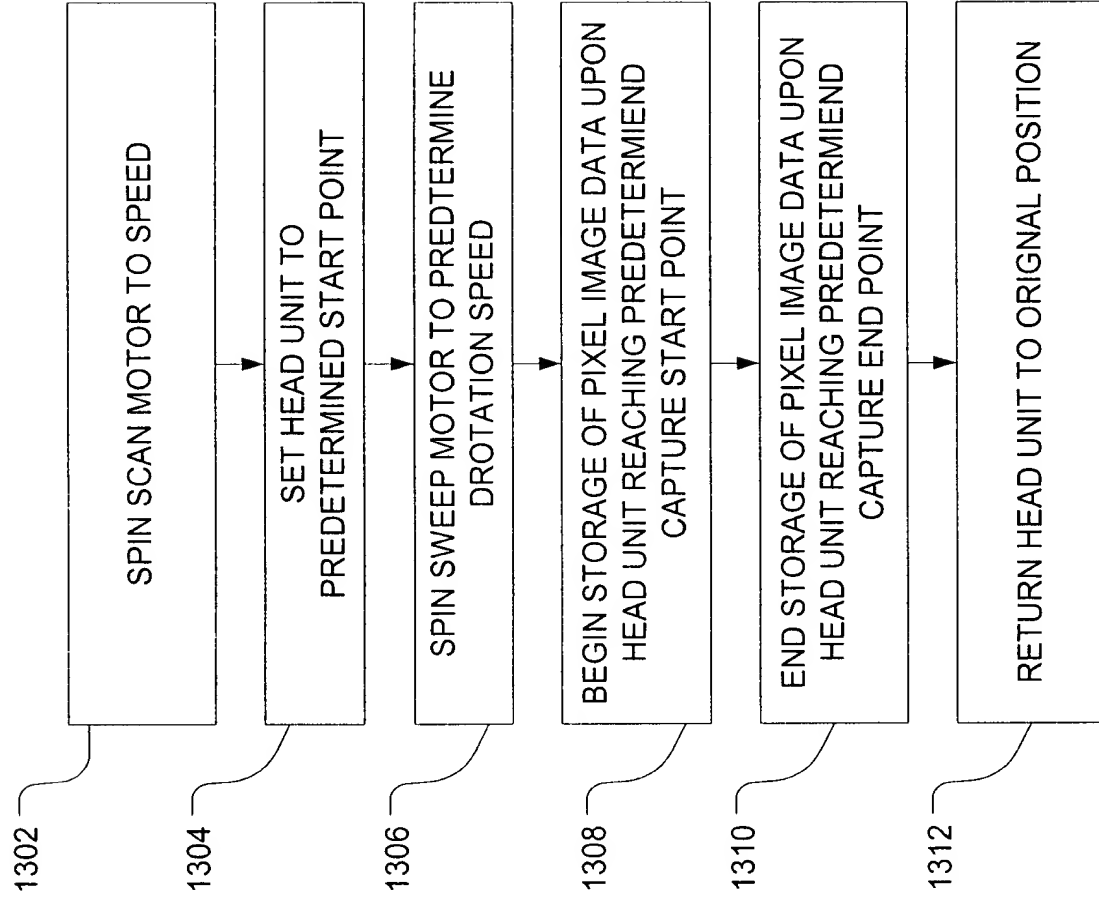


FIG. 13